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ABSTRACT

This packet contains 10 integrated academic and vocational education lesson plans developed by teams of high school teachers in Virginia. Six of the lesson plans were developed through collaborations of vocational and academic teachers. The other four, developed by teams of academic teachers, have strong vocational applications. The lesson plans cover the following topics: (1) writing a letter of request; (2) translating by computer; (3) using a bank account; (4) comparing fine arts and technical drawing; (5) constructing a career plan; (6) exploring world trade; (7) converting energy; (8) determining density; (9) comparing blood cells; and (10) fighting alcohol abuse. Each one- or two-page lesson plan consists of a note on the integrated discipline, an objective, a vocational application, materials needed, activities, and evaluation of student performance. (KC)

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Integrated Lesson Plans

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Commonwealth of Virginia
Department of Education
Vocational, Adult, and Employment Training Services
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Integrated Lesson Plans

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Preface

One of the most effective initiatives for improving student performance is to answer the question, "Why do I have to learn this?" Many teachers help students find the answer to this question by including real-world applications of concepts and theories. Other teachers help students connect hands-on applications to larger concepts and systems, providing invaluable knowledge and skills for continuing education and career success. When teams of teachers create lessons that integrate academic and vocational components, students benefit from both approaches.

The team approach to lesson plans benefits teachers as well: working together sparks creativity, facilitates willingness to try new instruction, and enhances professional growth.

Last year, teams of teachers from Lakeland High School, Suffolk, created a number of integrated lesson plans. Ten of them are presented here as examples of their effort. Of these ten, six are collaborations of vocational and academic teachers. The other four, developed by teams of acadmic teachers, have strong vocational applications.

I hope that these examples will encourage other teams of teachers to develop similar integrated instructional plans that could be published and distributed to teachers statewide at regular intervals. Schools who wish to contribute to a statewide collection of plans may submit them to VVCRC, 2200 Mountain Road, Glen Allen, VA 23060.

Dr. Neils W. Brooks, Director
Office of Vocational, Adult, and Employment Training Services
Virginia Department of Education

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Sue Baker, English
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Roberta Wilson, Government.

The material was edited, designed, and produced by the Virginia Vocational Curriculum and Resource Center, administered by Henrico County Public Schools, Department of Technical and Continuing Education:

Peggy L. Watson, Director
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Writing a Letter of Request

Integrated Disciplines

Agriculture, English

Objective

Write a letter requesting information, a product, or service related to agriculture.

Vocational Application

- Explore segments of agricultural business.
- Compose business correspondence.

Materials Needed

- List of agricultural companies and their addresses
- Samples or transparencies of correct letter formats
- Computer, word processing software

Activities

1. Discuss the major types of agricultural businesses in Virginia.
2. Allow each student to select a type of agricultural business for further research.
3. Present explanations and illustrations of business letters of request.
4. Have the class compose a sample letter of request.
5. Have each student write a rough draft of a letter to an agricultural business requesting information and have it reviewed and edited by a partner.
6. Have students use a computer with word processing package to produce final copies of their letters.

Evaluation of Student Performance

- English teacher evaluates letters for correct format, language usage, mechanics, and spelling.
- Agriculture teacher evaluates content of letters.

Contributed by **Ronald Daughtrey,** Agricultural Education, and **Sue Baker,** English, 1/95

Translating by Computer

Integrated Disciplines

Business, Spanish IV

Objective

Compare manual and computer-generated translations.

Vocational Application

- Use a computer to perform a necessary task.
- Translate written material from one language to another.

Materials Needed

- Spanish text
- Computer, translation software

Activities

Have students

- load a translation program from a diskette
- manually translate a number of sentences from English to Spanish, and enter the Spanish text on the computer
- run the translation program
- print results
- compare the printed translation to the original English sentences
- analyze success or failure of translations.

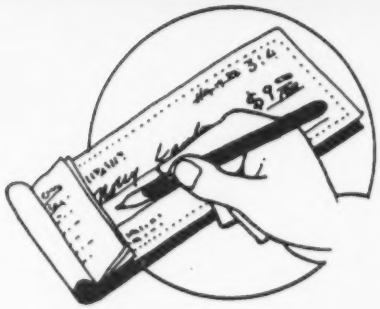
Evaluation of Student Performance

Acceptable performance requires

- successful completion of each activity
- submission of a copy of the printed final results
- determination of factors contributing to any errors.

Contributed by **L. Bull,** Spanish IV, and **M. Martin,** Basic Computer Applications

Using a Bank Account



Integrated Disciplines

Business, Special Education

Objectives

- Write a check.
- Fill out a deposit slip.
- Fill out a withdrawal slip.
- Complete account register.

Vocational Application

- Prepare business papers associated with checking and savings accounts.
- Keep records of funds received and spent.

Materials Needed

- Checks, deposit and withdrawal slips, check register
- Samples or transparencies of correctly and incorrectly completed checks

Activities

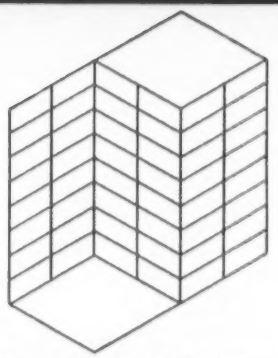
1. Distribute and discuss the components of a blank check.
2. Have students fill out checks, using teacher-provided information.
3. Have students subtract amounts of checks from the check register.
3. Show samples of checks that were not accepted by the bank because they were incorrectly filled out.
4. Have students list mistakes in checks.
5. Repeat activity, using deposit and withdrawal slips and savings account register.

Evaluation of Student Performance

- 80% of checks, deposit slips, and withdrawal slips must be completed correctly.
- Register calculations must be correct.

Contributed by **D. Pearson,** Special Education, and **V. Taliaferro,** Business Education, 1/95

Comparing Fine Arts and Technical Drawing



Integrated Disciplines

Technical Drawing, Art

Objectives

Compare fine art and technical drawing, focusing on the purpose of the drawing, its intended use, use of materials, use of mathematical concepts, and method of drawing.

Vocational Application

- Examine elements of design.
- Use free-hand and technical drawing for their intended purposes.

Materials Needed

- Fine arts: drawing paper, object, pencil
- Technical drawing: paper, pencil, drawing board, angles, scale, compass

Activities

1. Discuss and illustrate
   - materials and designs
   - fabrication techniques and design
   - elements of design: line, shape, space, form, tone, color, and texture.
2. Show illustrations of the principles of arrangement: proportion, balance, rhythm, emphasis, and harmony.
3. Discuss design influences: social, economic, political, religious, and use.
4. Present and demonstrate criteria for evaluation of student drawings.
5. Have students draw an assigned object, using free-hand and technical drawing methods.
6. Have students list the similarities and differences in drawings.

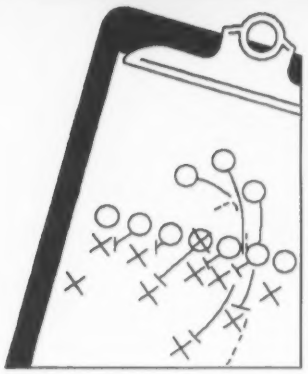
Evaluation of Student Performance

Acceptable performance requires a drawing that meets the criteria provided and a list of similarities and differences. Differences may include

- purpose or intended use
- use of math concepts
- use of exact geometrical objects
- distortion/intended exaggerations
- lack of exact measurements in free-hand drawing.

Contributed by **Barbara West**, Art, and **William T. Hart**, Technology Education

Constructing a Career Plan



Integrated Disciplines

Education for Employment (EFE), English

Objective

Research a career choice for history/background, education requirements, skill requirements, opportunities for advancement, hours and wages, physical requirements, working conditions, special requirements, and outlook.

Vocational Application

- Scan materials to locate specific information.
- Summarize information obtained by reading.
- Practice effective listening, speaking, and writing skills.

Materials Needed

- *Applied Communications,* Module 1
- References (print, video, and computer) on careers

Activities

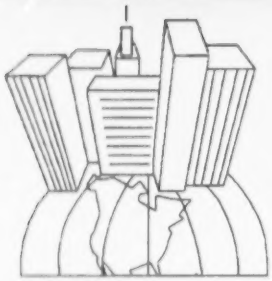
1. Show samples of career reports.
2. Discuss criteria for evaluating information sources.
3. Have students view videos on various careers, on interviewing, and on communicating in the workplace and respond to teacher-provided questions.
4. Have students
   - complete a career report by gathering information from appropriate sources.
   - design a posterboard of clothing worn, materials used, and other related aids to presentation.
   - give an oral presentation on a career choice and respond to class-generated questions.

Evaluation of Student Performance

- Individual grades are assigned weekly for sections completed.
- Completed report and aids are evaluated for usefulness and accuracy of information.

Contributed by **Ed Sawyer,** EFE, and **Sylvia Bond,** English, 1/95

Exploring World Trade



Integrated Disciplines

Marketing, Social Studies (Economics)

Objective

Explain the advantages of trading with other nations.

Vocational Applicatic:

Examine the marketing, finances, and implications of international trade.

Materials Needed

Various trading items in bags, one bag for each student
Questions for discussion

Activities

Trading activity

1. Divide bags into groups and mark each group by color. Distribute one bag and one recording form to each student.
2. Divide students into small groups for discussion and reporting purposes.
3. Have students examine the contents of their bag and assign a value (0 for no value to 100 for high value) to each item. Each student records this information in column 1.
4. Explain that bags of the same color are in the same trading block. Allow students 3 minutes to trade items in the same trading block; **they can only trade for an item of higher value.**
5. Have students return to their small group, assign values to the items they now have, and complete columns 2 and 3.
6. Ask students to announce the contents of their bag, then allow them 5 minutes to trade with all members of the class. They can only trade for an item of higher value.
7. Have students return to their groups, evaluate their items, and complete column 4.
8. Ask each group to write a paragaph explaining what happened and identifying their conclusions about the experience. Then ask them to compose a second paragraph that addresses the following questions:
   - What would have happened to prices and number of trades if each trade had to reported to the government (the teacher) and if the government charged a tax on each trade?
   - What would have happened if only a limited number of trades were allowed between two trading blocks?

Contributed by **Jean Draper,** Marketing, and **India Meissel,** Social Studies, 11/94

Evaluation of Student Performance

Questions for Discussion

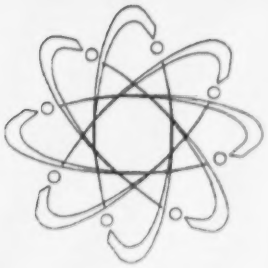
1. How many of you were satisfied with what you started with?
2. How many of you made trades?
3. Did any of you trade more than once?
4. Why did you trade?
5. Why did people who had items of personal value tend to trade?
6. What did you win and lose in your trades?
7. Do you think trading in the real world is similar to this exercise? Why or why not?

TRADE RECORD

(1) Name Item/value	(2) No trade Item/value	(3) Domestic trade Item/value	(4) International trade Item/value
TOTAL			

Note: This is the introductory lesson to a 2+ week interdisciplinary unit on international trade and exchange.

Converting Energy



Integrated Disciplines

Earth Science, Math 9, and LD Resource

Objectives

- Define nuclear energy.
- Differentiate between fission and fusion.
- Change hydrogen to helium, and find the weight of each.
- Demonstrate energy conversion as it relates to the econosystem.

Vocational Application

Build a device that operates by energy conversion.

Materials Needed

- Basic earth science and math texts
- Wood, paints, glass containers, small plants, large styrofoam balls, plastic paper
- Posterboard

Activities

Have students

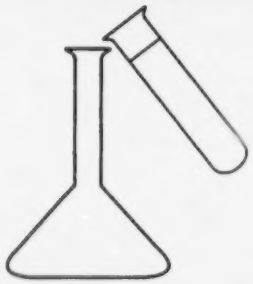
- define vocabulary terms and practice pronunciation.
- read (or listen as teacher reads aloud) and discuss each section in detail.
- conduct research on nuclear energy, and prepare written report for class.
- construct and demonstrate a toy or device that illustrates energy conversion
- plant a small plant to observe photosynthesis.
- place an open-topped container of water in direct sunlight, and cover the top with a piece of clear plastic or glass; observe at intervals. What happens to the underside of the cover? Discuss what happened and why.
- construct a chart to demonstrate Deuterium-Fritium (D-T) Fusion Reaction.
- design conversion chart.
- solve at least 15 out of 20 math problems correctly changing hydrogen to helium weight.

Evaluation of Student Performance

- 15-minute oral drill at the end of each class
- 85% mastery of objectives
- Test at conclusion of entire lesson

Contributed by **W. M. Ricks,** Earth Science, and **R. Sanders,** Math 9 and LD Resource

Determining Density



Integrated Disciplines

Chemistry, Algebra 2

Objective

Determine the density of water, oil, and irregularly shaped solids.

Vocational Application

- Use a computer to perform calculations and illustrate results.
- Perform laboratory procedures.
- Compare values calculated by measurement with those calculated mathematically.

Materials Needed

- Lab equipment
- IBM computer with T181 computer software

Activities

Have students

- perform lab procedure
- calculate density, using $d = m/v$ for each substance and data taken in parts A and B only (for the water and the oil)
- graph m vs. v using graphing software, calculate the slope of the line, and compare the slope to the density values calculated in the lab.

Evaluation of Student Performance

Grade will be determined by averaging the grades on

- the lab data table, which should be complete with numbers written to the correct number of significant digits
- graphs
- answers to the four conclusions at the end of the lab.

Contributed by **Debbie Bowles**, Chemistry, and **Mary Brown**, Algebra 2

Comparing Blood Cells

Integrated Disciplines

Biology, Special Education (Math)

Objective

Compare the numbers of blood cells in two samples.

Vocational Application

- Perform tasks required of a Medical Assistant.

Materials Needed

- Sheet of clear plastic
- Marking pencil

Activities

Have students identify the three types of blood cells (red, white, and platelets), count all of each type, and compare the number of cells in Sample A to Sample B.

- Which blood cells do you find the most of in Sample A? In Sample B? Which blood cells do you find the fewest of in Sample A? In Sample B?
- Why do you think you have more of this blood cell in this sample? Why do you think you have a smaller amount of this blood cell?

Evaluation of Student Performance

Students compare Sample A to Sample B:

- Which sample has more red blood cells?
- Which sample has more white blood cells?
- Which sample has more platelets?

Contributed by **Doris V. Daughtry**, Special Education (Math), and **Sylvia Wade**, Biology, 1/95

Fighting Alcohol Abuse

Integrated Disciplines

Health/Physical Education, U.S. Government

Objectives

- Describe ways in which drinking and driving affects everyone's daily lives.
- Explain the role of government in enforcing alcohol-related legislation.
- Explain why some Americans fear the new drinking laws may violate the Constitution.
- Compare today's alcohol consumption to that of the 19th century.
- Explain the effects of alcohol use on drivers.
- Compare methods of determining Blood Alcohol Content.
- Identify support/help groups.

Vocational Application

- Describe technology used to determine Blood Alcohol Content.
- Identify the impact of alcohol abuse on the work force.
- Produce media advertisements.

Materials Needed

- Overhead projector, VCR
- DUI/DWI transparencies
- Handouts: sample ads, pamphlets from MADD and SADD, information about alcohol-related laws and the physical effects of drinking

Activity

To conclude, have small groups of students use the information gathered from study of the objectives to develop print, radio, or TV ads that discourage drinking or drinking and driving.

Evaluation of Student Performance

- Written test on objectives
- Effectiveness and accuracy of ad

Contributed by **James Dabney**, Health/Physical Education, and **Roberta Wilson**, Government, 1/95

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